

MODEL STANDING ORDERS

Hepatitis B Vaccine (Recombinant)

These model standing orders are current as of April 2004. They should be reviewed carefully against the most current recommendations and may be revised by the clinician signing them.

Hepatitis B vaccine is indicated for:

1. All infants;
2. All children and adolescents through age 18;
3. Infants born to mothers who are hepatitis B surface antigen (HBsAg)-positive;
4. Children at risk of acquisition of hepatitis B virus (HBV) by person-to-person (horizontal) transmission, such as those born to mothers from hepatitis B endemic countries, including Asia, Pacific Islands, Africa, the Middle East, Eastern Europe, Northern South America, and Alaska;
5. Users of intravenous drugs;
6. Sexually active heterosexual persons with more than one sex partner in the previous 6 months or who have a sexually transmitted disease;
7. Men who have sex with men;
8. Health care workers and others at occupational risk of exposure to blood or blood-contaminated body fluid, including health science students;
9. Residents and staff of institutions for developmentally disabled persons;
10. Staff of nonresidential child care and school programs for developmentally disabled persons if the program is attended by a known HBsAg-positive person;
11. Patients undergoing hemodialysis;
12. Patients with bleeding disorders who receive clotting factor concentrates;
13. Household contacts and sexual partners of people with chronic HBV infection;
14. Members of households with adoptees who are HBsAg-positive;
15. Long-term (≥ 6 months) international travelers to areas in which HBV infection is of high or intermediate endemicity;
16. Inmates of juvenile detention and long-term correctional facilities;
17. Persons with chronic liver disease (e.g., hepatitis C infection);
18. Persons with HIV infection;
19. Persons working in the sex trade.

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ORDER:

1. Provide patient, parent or legal representative with a copy of the Vaccine Information Statement (VIS) and answer any questions.
2. Screen for contraindications according to Table 1.
3. Administer hepatitis B vaccine intramuscularly (IM) according to the recommended schedule (see Tables 2 – 7). The dose of hepatitis B vaccine depends upon the vaccine manufacturer and formulation, and the age of the patient. **Always check the package insert prior to administration of any vaccine.** Administer IM vaccines at a 90° angle with a 22- to 25-gauge needle.
 - a. For infants \leq 12 months of age, administer into the anterolateral aspect of the thigh with a 7/8- to 1-inch needle. (For newborn and or low birth weight infants only, a 5/8” needle may be considered.)
 - b. For children \geq 12 months of age, administer into the anterolateral aspect of the thigh or deltoid muscle, using a 7/8- to 1¼-inch needle, depending on the size of the needle.
 - c. For adolescents and adults, administer in the deltoid using a 1- to 2-inch needle, depending on the vaccine recipient’s weight (1 inch for females < 70 kg; 1.5 inches for females 70-100 kg; 1 to 1.5 inches for males \leq 120 kg; and 2 inches for males > 120 kg and females > 100 kg).
4. Administer hepatitis B vaccine simultaneously with all other vaccines indicated, according to the recommended schedule and patient’s vaccine status.
5. If possible, observe patient for an allergic reaction for 15 - 20 minutes after administering vaccine.
6. Facilities and personnel should be available for treating immediate hypersensitivity reactions.
7. Report clinically significant adverse events to the Vaccine Adverse Event Reporting System (VAERS) at 1-800-822-7967, or via the VAERS website: www.vaers.org.
8. Please see the MIP document, *General Protocols for Standing Orders*, for further recommendations and requirements regarding vaccine administration, documentation, and consent.
9. Please see Section “D” of the MIP document, *General Protocols for Standing Orders*, for additional guidelines for school-based clinics.

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Table 1. Contraindications and Precautions to Hepatitis B Vaccine

Valid Contraindications to Hepatitis B Vaccine	Invalid Contraindications (hepatitis B vaccine should be administered)
Anaphylactic reaction to previous dose of hepatitis B vaccine, baker's yeast, latex ¹ , thimerosal ² , or to any other component of the vaccine (see package insert and Table 2 for specific components) ³	Mild illness with or without low-grade fever
	Non-anaphylactic allergy to any component of the vaccine
	Local reaction to a previous dose of hepatitis B vaccine
	Personal or family history of non-specific allergies
	Pregnancy
	Autoimmune disease (e.g., systemic lupus erythematosus or rheumatoid arthritis)
	Current antimicrobial therapy
<p align="center">Precautions to Hepatitis B Vaccine</p> <ul style="list-style-type: none"> Moderate to severe illness with or without fever (temporary precaution) <ul style="list-style-type: none"> Preterm infants: <ul style="list-style-type: none"> For preterm infants born to HBsAg-negative mothers: If the infant weighs < 2000 g at birth, the infant can receive the 1st dose of hepatitis B vaccine at chronological age 1 month. Premature infants discharged from the hospital before chronological age 1 month can also be administered hepatitis B vaccine at discharge, if they are medically stable and have gained weight consistently. vaccine should be delayed until the infant is 1 month of age or at hospital discharge. For preterm infants born to HBsAg-positive mothers (or status unknown): These infants should always receive HBIG and the 1st dose of hepatitis B vaccine at birth, regardless of the birth weight. If the infant weighs < 2000 g at birth, this initial dose should not be counted toward completion of the hepatitis B vaccine series, and 3 additional doses should be administered beginning when the infant is 1 month of age. Thus, these infants will need a total of 4 doses. 	

¹ Persons with a hypersensitivity to latex should receive Engerix[®], the SmithKline preparation, which, except for pediatric and adult formulations in pre-filled syringes, does not contain latex. Please refer to Table 2.

² Adults with an anaphylactic allergy to thimerosal should receive Engerix[®], the SmithKline preparation, which does not contain thimerosal. They may also receive Merck's Recombivax[®] in single-dose vials. Pediatric patients with an anaphylactic allergy to thimerosal should receive Engerix[®], the SmithKline preparation which does not contain thimerosal, or Merck's Recombivax[®] in single-dose vials as they do not contain thimerosal. However, children and adults should not receive Merck's Recombivax[®] in pre-filled syringes as they do contain thimerosal. Please refer to Table 2.

³ Persons with a history of anaphylaxis to a vaccine component, but who are at high risk for hepatitis B virus, should be referred to a health care provider for evaluation and possible administration of hepatitis B vaccine.

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SCHEDULES

For **all** schedules:

- 1) **Minimum intervals:** 1 month = 4 weeks = 28 days. Decreasing the recommended interval between doses may interfere with antibody response and protection;
- 2) **Maximum intervals:** There are no maximum intervals and it is not necessary to restart the series of any vaccine due to extended intervals between doses.

**Table 2. Routine 3-dose Hepatitis B Vaccine Schedule
for Infants Born to HBsAg-Negative Mothers**

<u>Dose</u>	<u>Recommended Age</u>	<u>Accelerated Schedule</u>
1	Birth	1 st visit
2	1 - 2 months	At least 1 mo. after the 1 st dose
3	6 - 18 months	At least 2 months after 2 nd dose, at least 4 months after 1 st dose, and no earlier than 24 weeks of age

**Table 3. Routine 3-dose Hepatitis B Vaccine Schedule
for Infants Born to HBsAg-Positive Mothers**

<u>Dose</u>	<u>Age</u>
1	Birth (with HBIG)
2	1 - 2 months
3	6 months

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Table 4. Hepatitis B Vaccine Schedule for Very Low Birth Weight Infants (< 2000 grams) Born to HBsAg-Positive, HBsAg Status Unknown, or HBsAg-Negative Mothers

Infants Born To:	HBIG	First Dose	Second Dose	Third Dose	Fourth Dose
HBsAg-positive mother	Within 12 hours of birth, with concurrent hepatitis B vaccine	Within 12 hours of birth, with concurrent HBIG	When 1 month of age	1 - 2 months after the 2 nd dose	≥ 2 months after 3 rd dose, ≥ 4 months after 2 nd dose, and no earlier than 24 weeks of age
HBsAg status unknown mother	Test mother for HBsAg immediately. If results unavailable, administer HBIG within 12 hours of birth	Within 12 hours of birth	If mother tests, HBsAg-positive, administer when 1 month of age.	If mother HBsAg-positive, administer 1 - 2 months after the 2 nd dose	If mother HBsAg-positive, ≥ 2 months after 3 rd dose, ≥ 4 months after 2 nd dose, and no earlier than 24 weeks of age
HBsAg-negative mother	None required	At 1 month of age or at hospital discharge	1 - 2 months after the 1 st dose	≥ 2 months after the 2 nd dose, ≥ 4 months after the 1 st dose, and no earlier than 24 weeks of age	None required

Table 5. Routine 3-dose Hepatitis B Vaccine Schedule for Children (< 11 years of age) and Adolescents (11 – 19 years of age)

<u>Dose</u>	<u>Schedule</u>¹	<u>Accelerated Schedule</u>
1	1 st visit	1 st visit
2	1-2 mos. after 1 st dose	At least 1 month after 1 st dose
3	4-6 mos. after 1 st dose	At least 2 months after 2 nd dose, at least 4 months after 1 st dose

¹ For older children and adolescents, doses may be given in a schedule of 0, 1, and 6 months or of 0, 1-2, and 4-6 months. For adolescents, spacing at 0, 12, and 24 months results in equivalent immunogenicity.

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Table 6. Optional 2-dose Hepatitis B Vaccine Schedule Using Recombivax HB® for Adolescents (11 – 15 years of age)^{1,2}

<u>Dose</u>	<u>Schedule</u>	<u>Accelerated Schedule</u>
1	1 st visit	1 st visit
2	4 – 6 months after 1 st dose	4 months after 1 st dose

¹ Adolescents (11 to 15 years of age **only**) may also use a **2-dose scheduling option**. This can be accomplished by administering, per dose, **either**:

- 1.0 ml of Merck's Recombivax HB® Adult Formulation (1 X 10 mcg/1.0 ml); **or**
- 1.0 ml of Merck's Recombivax HB® Pediatric Formulation (2 X 5.0 mcg/0.5 ml).

Administer the 1st dose at month 0, and the 2nd dose 4-6 months later (minimum interval between doses is 4 months). **Both** doses must be administered while the adolescent is 11-15 years of age, with the 2nd dose given by the 16th birthday.

² SmithKline Beecham's hepatitis B formulation is **not** currently licensed for the 2-dose schedule.

Table 7. Routine 3-dose Hepatitis B Vaccine Schedule for Adults

<u>Dose</u>	<u>Schedule</u>	<u>Accelerated Schedule</u>
1	1 st visit	1 st visit
2	1-2 mos. after 1 st dose	At least 1 month after 1 st dose
3	4-6 mos. after 1 st dose	At least 2 months after 2 nd dose, at least 4 months after 1 st dose

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Pre- and Post-Vaccination Serologic Testing – Hepatitis B Vaccine

1. Pre-vaccination serologic testing

- It is not indicated before routine vaccination of infants or children.
- It may be considered with vaccinating adolescents and adults in groups with high rates of hepatitis B virus (HBV) infection (i.e., HBV markers seroprevalence of > 20%), as long as testing does not delay or impede immunize efforts. These groups include:
 - Alaskan Natives
 - Pacific Islanders
 - Children of immigrants from endemic countries
 - Family members of HBV carriers

2. Post-vaccination serologic testing

- It is not routinely recommended for most infants, children, adolescents, and adults.
- It should, however, be considered for persons whose subsequent management depends on knowing their immune status, including:
 - Infants born to HBsAg-positive women (test for HBsAg and anti-HBs at 9 to 15 months of age [i.e., 3-9 months after the final dose of hepatitis B vaccine]; some experts prefer to perform serologic testing at 1 to 3 months after completion of the primary vaccination series)
 - Dialysis patients (test annually and administer a booster dose of the appropriate formulation if anti-HBs levels are < 10 mIU/mL)
 - Immunodeficient persons
 - Healthcare workers who have significant exposure to HBV (a catch-up program of serologic testing for previously vaccinated health care providers is not recommended; these individuals should be tested as necessary if they have significant exposure to HBV)

It is difficult to interpret the meaning of a negative anti-HBs serology in a person who received the hepatitis B vaccination series in the past and was not tested in the post vaccination period. Without post-vaccination testing, it is not possible to determine if persons testing negative years after vaccination represent true vaccination failure (i.e., no initial response), or have waned anti-HBs antibody below a level detectable by the test. The latter is the most likely explanation, because up to 60% of vaccinated people lose detectable antibody (but not protection) 9-15 years after vaccination.

Management of Non-Response to Hepatitis B Vaccine

- When necessary, post-vaccination testing should be performed 1-2 months after completion of the vaccine series. If anti-HBs levels are < 10 mIU/mL:
 - Complete a second series of 3 doses of hepatitis B vaccine
 - Administer on the usual schedule of 0, 1, and 6 months
 - Retest 1-2 months after completing the second series

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- A second, probably less expensive option is to administer a single dose of hepatitis B vaccine and test for anti-HBs in 4-6 weeks. If the person is anti-HBs positive, this most likely indicates a booster response in a previous responder, and no further vaccination (or serologic testing) is needed. If the person is anti-HBs negative after this “booster” dose, then a second series should be completed (i.e., 2 more doses).
- Fewer than 5% of vaccinees do not develop anti-HBs after 6 valid doses of hepatitis B vaccine. These vaccinees may be non-responders or “hypo-responders”.
 - Check these individuals’ HBsAg status
 - If HBsAg-negative and exposed to HBV, treat as non-responder with postexposure prophylaxis

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